Homedale Christian School, PWS# 3370029
SOURCE WATER ASSESSMENT FINAL REPORT

DATE: July 27, 2001

State of Idaho
Department of Environmental Quality

Disclaimer: This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on the data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the State of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for Homedale Christian School, near Homedale , Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The Homedale Christian School drinking water system consists of one well. The well has experienced inorganic chemical detections of fluoride; however, the detections have been below the maximum contaminant levels

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the Homedale Christian School, source water protection activities should focus on environmental education with the businesses, residents and with parties engaged in activities that may affect water quality within the vicinity. Practices aimed at reducing the leaching of chemicals from agricultural land within the designated source water areas should be focused. Most of the designated areas are outside the direct jurisdiction of Homedale Christian School. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission and local Soil Conservation District, and the Natural Resources Conservation Service. Activities such as recreation should be coordinated with the Bureau of Land Management, the Idaho Fish & Game Dept. and other related agencies.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies, please contact your regional Idaho Department of Environmental Quality office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR HOMEDALE CHRISTIAN SCHOOL

Section 1. Introduction - Basis for Assessment

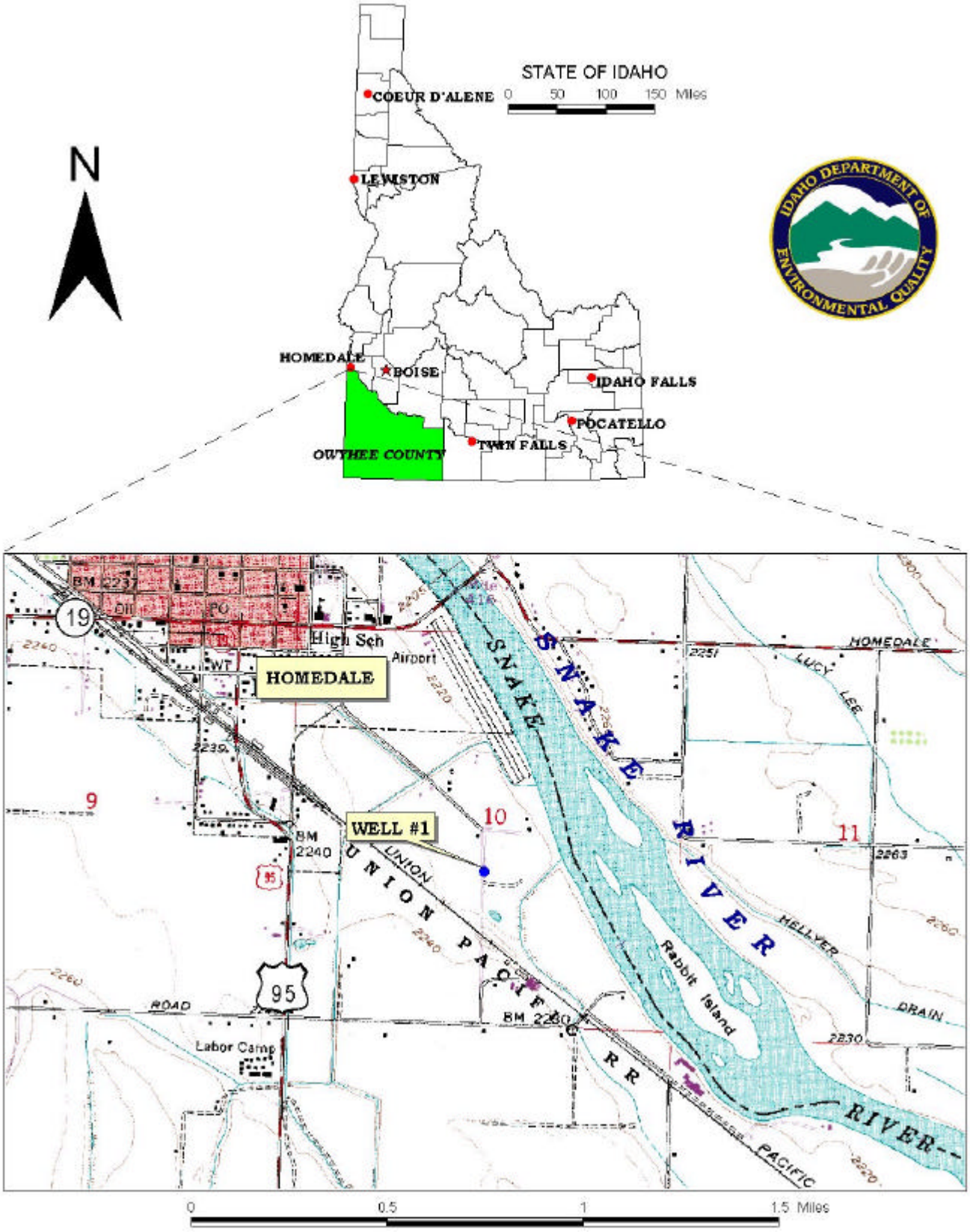
The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

FIGURE 1. Geographic Location of the Homedale Christian School



Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Homedale Christian School is located nearly 1 mile southeast of Homedale, Idaho serves a population of approximately 40 people. Homedale is located approximately 16 miles southwest of Caldwell, Idaho and 9 miles northwest of Marsing, along junctions State Highway 19 and U.S. Highway 95, just south of the Snake River (Figure 1) in Owyhee County. The public drinking water system for Homedale Christian School consists of one well.

The primary water quality issue currently facing Homedale Christian School consists of detections of several inorganic compounds that have been below the maximum contaminant levels and are most likely naturally occurring. Continued monitoring is important, and if the levels increase, treatment may be necessary.

Defining the Zones of Contribution - Delineation

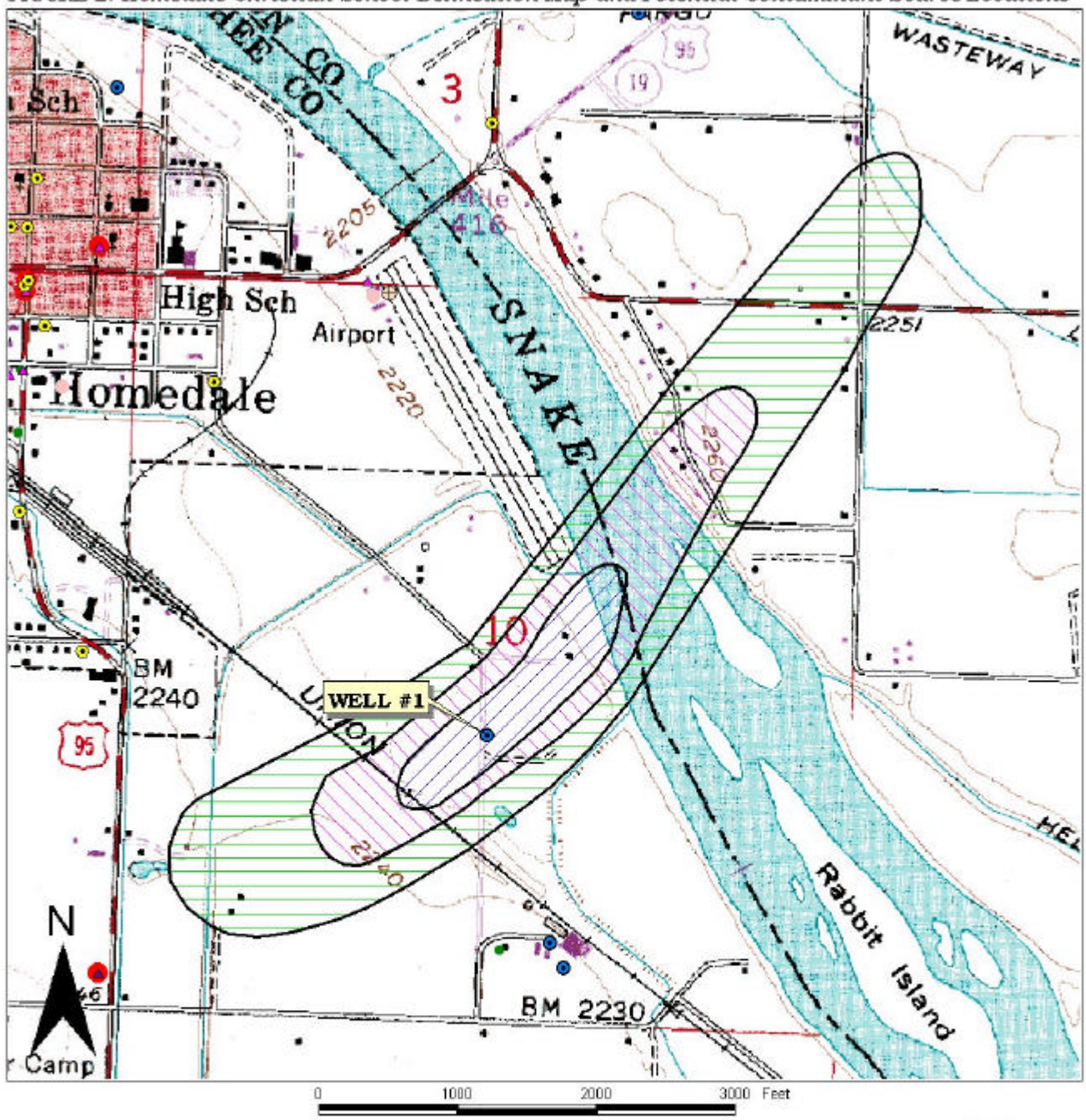
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the three-year (Zone 1B), six-year (Zone 2), and ten-year (Zone 3) time-of-travel (TOT) for water associated with the Homedale/Murphy and the Treasure Valley aquifer systems in the vicinity of the Homedale Christian School. The computer model used site-specific data, assimilated by DEQ from a variety of sources including other local well logs.

A drilling log for the Homedale Christian School is not available. Subsurface geologic information has been interpolated by geologic cross section of surrounding wells. Well depths, static water levels, and pump setting information were obtained from drinking water system correspondence files. The well is believed to be obtaining water from an upper unconfined aquifer based on pumping level information. Based on water chemistry, it is believed that the well may also be influenced by a lower confined aquifer that is not restricted geographically by the aquifer system boundaries; therefore, both the upper and lower aquifers were delineated. The delineated source water assessment area for the Homedale Christian School can best be described as a northeast/southwest elongated area encompassing roughly 179 acres in total for both the upper and lower aquifers (Figure 2). The actual data used by DEQ in determining the source water assessment delineation area is available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

FIGURE 2. Homedale Christian School Delineation Map and Potential Contaminant Source Locations



LEGEND

Time of Travel Zones
- 1B (3 yr TOT)
- 2 (6 yr TOT)
- 3 (10 yr TOT)
- Wellhead
- Enhanced Inventory
- CERCLIS Site
- RICRIS Site
- Dairy
- LUST Site
- Closed UST Site
- Open UST Site
- Business Mailing List
- NPDES Site
- Mine
- AST
- Toxic Release Inventory
- SARA Title III Site (EPCRA)
- Recharge Point
- Injection Well
- Group1 Site
- Cyanide Site
- Landfill
- Wastewater Land App Site

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

PWS# 3370029
WELL #1

Land use in the immediate vicinity of Homedale Christian School consists predominantly of irrigated agriculture. Land use outside of the immediate vicinity of Homedale Christian School is also predominantly irrigated agriculture with a small amount of urban land use consisting of light manufacturing, residential homes and small businesses. The homes in the area operate with individual septic systems.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted during January of 2001. This involved identifying and documenting potential contaminant sources within the Homedale Christian School Source Water Assessment Area through the use of computer databases and Geographic Information System maps developed by DEQ.

No potential contaminant sources were located within the delineated source water area for the well.

Section 3. Susceptibility Analyses

The susceptibility of the well to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity was moderate for the Homedale Christian School Well. This score is based on soil drainage, vadose zone characteristics (unsaturated sequence above the water table), depth to first ground water and the presence of an aquitard (impermeable layer above a confined aquifer).

Well Construction

Well construction directly affects the ability of the wells to protect the aquifer from contaminants. Lower scores imply a system that can better protect the water. The Homedale Christian School drinking water system consists of one well that extracts ground water for domestic and industrial uses. The well system construction score is high for the well. The most recent sanitary survey (1995) of the well indicated that the surface seal required repair.

A drilling log for the Homedale Christian School is unavailable. Subsurface geologic and hydrogeologic information has been interpolated by geologic cross section of surrounding wells. The well depth and pump setting information was obtained from water system correspondence files. The well is completed at 160 feet below land surface, within the lower aquifer, under a thick blue clay sequence, that may offer protection from surficial activities. The presence of an inorganic chemical compound (below maximum contaminant levels) fluoride is indicative of the lower aquifer, while the pump setting is within the upper unconfined aquifer at a depth of 40 feet below land surface.

The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all public water systems (PWS's) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWS's follow the *Recommended Standards for Water Works (1997)* during construction. Various aspects of the standards can be assessed from well logs. Without the drilling log, it is not possible to determine if current well construction standards have been met.

Table 1. Selected Construction Characteristics of Homedale Christian School Well.

Well #	Total Depth (ft.)	Screened Interval (ft. below ground surface)	Screen Below Blue Clay?	Surface Seal (ft.)	Gravel Pack Interval (ft.)
1	160	Unknown	Unknown	Unknown	Unknown

Potential Contaminant Source and Land Use

The well for the Homedale Christian School ranked in the moderate category for synthetic organic chemical classes; in the low category for volatile organic, inorganic chemical classes, and microbial contaminants in terms of potential contaminant sources and land use. Land use is predominantly urban with irrigated agriculture. County level herbicide use based on chemical sales is considered high while the county level nitrogen use is rated moderate. The area is also within an inorganic priority area for arsenic, however no detections of the constituent have occurred in monitoring data.

Final Susceptibility Ranking

In terms of the total susceptibility score, it can be seen from Table 3 that the well ranked moderate in susceptibility to inorganic, volatile organic, synthetic organic and microbial chemicals. Fluoride, an inorganic chemical has been detected below maximum contaminant levels and may be naturally occurring.

Table 2. Summary of Homedale Christian School Susceptibility Evaluation

	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
Well #		IOC	VOC	SOC	Microbial		IOC	VOC	SOC	Microbial
1	M	L	L	M	L	H	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
[2]H* - Indicates source automatically scored as high susceptibility due to presence of either a VOC, SOC or microbial detected or an IOC above the maximum contaminant level in the tested drinking water

Susceptibility Summary

The Homedale Christian School drinking water system experienced a problem with the well seal (rotted vent plug) in the 1995 sanitary survey. If the situation has been remedied, the system construction score can be lowered to moderate. The system has experienced detections of an inorganic compound below maximum contaminant levels. The inorganic compound detected in the system may be naturally occurring, but should be monitored closely.

The well is located in an inorganic priority area for arsenic, which is probably naturally occurring. The well is located within a high herbicide usage area, based on county-level herbicide sale records. The well appears to be completed within a deeper confined aquifer (as indicated by inorganic chemical analyses) that may offer some protection from surficial contaminants; however the pump levels appear to be set within the upper unconfined aquifer. Because the drilling log for well is unavailable, little is known regarding the well construction, other than what is indicated in the sanitary survey of 1995.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the Homedale Christian School, source water protection activities should focus on environmental education with the business operators, residents and with parties engaged in activities that may affect water quality within the vicinity. Most of the delineated areas are outside the direct jurisdiction of the Homedale Christian School. Partnerships with state and local agricultural agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities can be coordinated with the Idaho Department of Agriculture, the Idaho Department of Fish and Game, the U.S. Bureau of Land Management, and other federal, state and local agencies.

Assistance

Public water supplies and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Boise Regional IDEQ Office (208) 373-0550

State IDEQ Office (208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. *"Recommended Standards for Water Works."*

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Idaho Division of Environmental Quality, 1997. *Idaho Wellhead Protection Plan*.

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U.S. Department of Agriculture (USDA) Soil Conservation Service, 1991. *Soil Survey of Elmore County Area, Parts of Elmore, Owyhee and Ada Counties*

Attachment A
Homedale Christian School
Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

> 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : HOMEDALE CHRISTIAN SCHOOL Well# : WELL 1

Public Water System Number 3370029 5/4/01 10:26:01 AM

1. System Construction			SCORE			
Drill Date		1/1/1100				
Driller Log Available		NO				
Sanitary Survey (if yes, indicate date of last survey)		YES	1995			
Well meets IDWR construction standards		NO	1			
Wellhead and surface seal maintained		NO	1			
Casing and annular seal extend to low permeability unit		NO	2			
Highest production 100 feet below static water level		NO	1			
Well located outside the 100 year flood plain		YES	0			
Total System Construction Score			5			
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained		NO	2			
Vadose zone composed of gravel, fractured rock or unknown		YES	1			
Depth to first water > 300 feet		NO	1			
Aquitard present with > 50 feet cumulative thickness		YES	0			
Total Hydrologic Score			4			
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A		IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high		YES	0	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A		NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A			2	2	4	2
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)		NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum			0	0	0	0
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
4 Points Maximum			0	0	0	
Zone 1B contains or intercepts a Group 1 Area		YES	2	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land		4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B			6	4	6	4
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present		NO	0	0	0	
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
Land Use Zone II	Greater Than 50% Non-Irrigated Agricultural		1	1	1	
Potential Contaminant Source / Land Use Score - Zone II			1	1	1	0
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present		NO	0	0	0	
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of		YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III			1	1	1	0
Cumulative Potential Contaminant / Land Use Score			10	8	12	6
4. Final Susceptibility Source Score			11	11	11	11
5. Final Well Ranking			Moderate	Moderate	Moderate	Moderate

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory. Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water